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## (54) High frequency printing mechanism.

(57) High frequency printing mechanism with an ink-jet ejection device which is capable of ejection of ink (including hot melt ink) at jet frequencies greater than 50,000 Hz. A cantilevered beam (12) is mounted at its base (14) to a piezoelectric element (18) which oscillates the base. The beam is shaped so that its moment of inertia is reduced toward its free end (16). The element (18) is activated by an oscillating electrical signal the frequency of which is equal to or close to a natural frequency of oscillation of the beam (12). At this frequency of oscillation of the beam, the tip (15) of the beam ocillates over an amplitude which is significantly greater than the oscillation amplitude of the base. The tip (15) of the beam is provided with an aperture which is preferably tapered in cross-section. One opening of the tapered aperture is in fluid communication with a reservoir (19) of ink and the other opening of the aperture is positioned at an appropriate distance from a printing paper towards which individual droplets of ink from the reservoir are to be propelled. When the tip amplitude is above a predetermined threshold, the solid-fluid interaction between the aperture and the ink causes a drop of ink to be accelerated through the aperture and be ejected upon each excursion of the tip of the beam toward the printing media.

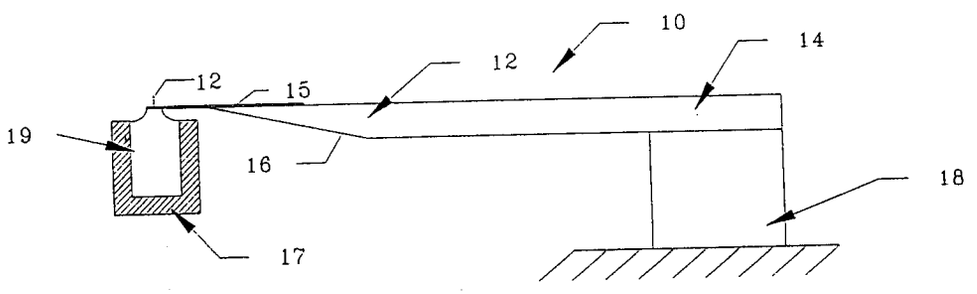


FIG 1

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# EUROPEAN SEARCH REPORT

Application Number

EP 92 10 6964

## DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (Int. Cl.5 ) |
|---|---|---|---|
| X<br>A | US-A-3 950 760 (I-D. STROMBERGER)<br>* column 2, line 15 - line 57; figure 1 * | 1,13<br>3,5,6,8 | B41J2/04 |
| A | PATENT ABSTRACTS OF JAPAN<br>vol. 10, no. 153 (M-484)(2209) 3 June 1986<br>& JP-A-61 008 357 ( S. TAKEKADO ) 16 January 1986<br>* abstract * | 1,2,8 | |
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| A | PATENT ABSTRACTS OF JAPAN<br>vol. 8, no. 270 (M-344)(1707) 11 December 1984<br>& JP-A-59 142 163 ( Y. NISHIMURA ) 15 August 1984<br>* abstract * | 1 | |

TECHNICAL FIELDS SEARCHED (Int. Cl.5 )

B41J

The present search report has been drawn up for all claims

| Place of search | Date of completion of the search | Examiner |
|---|---|---|
| THE HAGUE | 16 NOVEMBER 1992 | G. v/d MEERSCHAUT |

CATEGORY OF CITED DOCUMENTS

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